

Identifying, Monitoring, and Enhancing Wild Bees on Apple and Blueberry Farms UMaine Cooperative Extension Factsheet—DRAFT PROFILE

Farmer-to-Farmer: Case Studies of Wild Bee Habitat Enhancement in Maine



Figure 1. Harvest time at The Apple Farm in Fairfield, Maine. Photo by Marilyn Meyerhans.

Lakeside Orchards & The Apple Farm
Owned and operated by Steve and Marilyn Meyerhans

The Apple Farm
104 Back Road
Fairfield, ME 04937
207-453-7656

Lakeside Orchards
318 Readfield Rd. Rt. 17
Manchester, ME
207-622-2479

lakesideorchards@gmail.com
<http://www.lakesideorchards.com/>

Farm history. Steve and Marilyn Meyerhans own and operate Lakeside Orchards in Manchester, Maine, and The Apple Farm in Fairfield, Maine. They purchased The Apple Farm in 1973 and for more than 40 years have been growing conventional and old-variety apples including McIntosh, Northern Spy, Golden Russet, Pearmain, and Winter Banana. Between their two orchards they grow 12 acres of certified organic apples and 88 acres of conventional apples using Integrated Pest Management (IPM) practices. They also grow four varieties of pear, operate two farm market retail stores at The Apple Farm and Lakeside Orchards, and offer pick-your-own apples. As expressed in their mission statement, Steve and Marilyn are committed to growing “the best food possible in the least environmentally disruptive way...and are committed to preserving agricultural land for today's and tomorrow's needs.”

Assessing pollination management. When Marilyn and Steve first began growing apples in Somerset and Kennebec Counties in the 1970's, wild bees—particularly bumblebees and sweat bees—were abundant enough to provide all the necessary pollination for their orchards. In the early 1980's they began supplementing pollination with commercial honeybee hives, and in the 1990's began noticing a dramatic decline in wild bees. Declines in the abundance of wild bees in Maine have occurred due to a host of factors including habitat loss, pests and diseases, and pesticide use. Additionally, feral honeybee populations now rarely survive without human management due primarily to one pest, the Varroa mite (*Varroa destructor*).

These trends are concerning for Steve and Marilyn, who appreciate the importance of pollination. To ensure good pollination they assess their orchards in several ways. For example,

they assess pollination based on the number and shape of the apples their trees produce. If the apples are misshapen, that indicates that a good fruit set did not occur and the apples were not properly pollinated. They also assess pollination by cutting open a small sample of apples and checking that the seeds are fully developed.



Figure 2. A large garden grows near the farm store at Lakeside Orchard and provides additional forage for wild bees. In particular a large planting of mustard attracts many wild bees. Although mustard is not every farmers' favorite plant, the Meyerhans' have observed that the bees love it. Photo by Marilyn Meyerhans.

Another strategy is to use the UMaine Cooperative Extension method for assessing bee abundance and estimating fruit set (see page XX of this Factsheet). In May, 2014, Marilyn attended a free hands-on pollination workshop at Highmoor Farm. The workshop, facilitated by Dr. Frank Drummond and funded by Northeast SARE, presented the Extension method and formula for assessing types and abundance of bees visiting flowers in an orchard. After the workshop Marilyn tested the method in her orchards and plans to continue monitoring the types and abundance of bees so she and Steve can make informed pollination management decisions.

Currently, Steve and Marilyn use a combination of honeybee colonies and wild bee habitat enhancement, giving them confidence and reassurance that they have strong management in place for adequate pollination. During apple bloom a local beekeeper places between 30-40 nucleus colonies (depending on the strength of the colonies each year) throughout their orchards. In addition, they are working to provide nesting sites and continuous pollen and nectar sources for wild bees.

Wild bee habitat enhancement. Marilyn and Steve use several strategies to enhance wild bee habitat at their orchards. Between Lakeside Orchards and The Apple Farm, they maintain approximately 30 acres of fields as meadows rich in wildflowers like common milkweed (*Asclepias syriaca*), Queen Anne's lace (*Daucus carota*), Black-eyed Susan (*Rudbeckia hirta*), wild mustard, and other naturally occurring native plants. They mow the fields every two years on an alternate cycle to maintain a continuous food source for bees, butterflies, and other pollinators.

Steve and Marilyn are also experimenting with advanced pollinator habitat enhancement strategies. In spring 2014, they planted a pollinator strip—a seed mix of wildflowers that are attractive and healthy for bees. The wildflower mix was purchased from Johnny's Selected Seeds. Johnny's offers a "Bee Feed" mix that includes low-maintenance perennials and reseeding annual wildflowers like Anise Hyssop (*Agastache foeniculum*), New England Aster

(*Aster novae-angliae*), Plains Coreopsis (*Coreopsis tinctoria*), and Purple Coneflower (*Echinacea purpurea*). Bee-friendly wildflower mixes are available through many sellers. When selecting and purchasing pollinator plants, it is important to talk with the seller to ensure that the seeds or plants are not treated with pesticides that are known to be toxic to bees. For a great resource on selecting bee-friendly flowers and properly locating and planting pollinator strips, see *Enhancing Wild Bees for Crop Pollination* (Venturini et al., 2015).

A key component of the Meyerhans' pollination management is to encourage bees in pollinator-safe areas, and discourage them in areas that are treated with harmful pesticides. In the orchards they eliminate as many flowering plants as possible so as not to attract pollinators and other beneficial insects. Especially once they begin spraying insecticides for apple pests—typically in June—they cut back any flowering vegetation in the orchards.

A safe place for ground-nesting bees.

Happily, Lakeside Orchard and The Apple Farm are home to a strong population of beautiful green sweat bees (genus *Agapostemon*). Sweat bees nest in the ground, preferring exposed areas. About five years ago Steve and Marilyn began noticing large numbers of sweat bees nesting in the ground around their orchards. When they discovered the bees they stopped mowing those areas for fear of disturbing the bees, but quickly learned that the bees prefer mowed areas where the soil is heated by solar radiation. Now they mow the nesting sites to keep the sandy soil exposed, creating ideal habitat for ground-nesting bees.



Figure 3. Solitary, ground-nesting sweat bees have established nests in several areas around Lakeside Orchard and The Apple Farm.

The Meyerhans' are happy to have these efficient little sweat bees residing in their orchards, and often see them flying with their corbicula—the pollen baskets located on their hind legs—loaded with pollen. “We have a lot of school groups come to the orchard and we bring them over to the two areas where we have a lot of ground-nesting sweat bees,” says Marilyn. “We tell the kids, look down at the soil, and then the bees' little heads pop up and the kids think that's the coolest thing. We fenced in the area so that no one would walk on them. I've actually seen [the sweat bees] catch little cabbage worms and carrying them around in their legs. It's very cool. I've spent a lot of time watching these little bees.” Moving into the future, Steve and Marilyn plan to continue learning about the bees residing at their orchards and enhancing habitat for wild pollinators.